Dr. Bright

CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

MINES BRANCH

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AN ILLEGAL CHARACTER DETECTOR FOR USE WITH A PDP COMPUTER

by

C.A. Josling

Mineral Physics Section

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In programs written in Program Assembly Language (PAL) errors occur which are known as illegal characters (I.C.). These are printed out after the first pass with the "assembler" tape along with their approximate location. Because certain illegal characters do not print-out on a listing, they are difficult to locate. When I.C.'s occur on a tape they are usually located visually by comparing the questionable section to a known good piece of tape. As this is very time consuming, a program has been written which, can be put into the computer enabling it to pick out the I.C.'s as the tape is scanned.

The flow diagram of this program is shown in Figure 1. Each character of the tape is checked against a table of legal characters. After verification, the computer goes on to the next character. If the computer cannot find a character in the table to match the input code then this code must be an I.C. The code number is deposited in the accumulator of the computer and the tape is stopped with the character one space past the sensing device of the reader. This character can then be marked for later deletion. Depressing the continue key restarts the program and advances the tape being checked until another I.C. is

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*Technician, Mineral Physics Section, Mineral Sciences Division, Mines Branch, Department of Mines and Technical Surveys, Ottawa, Canada.

encountered or the end of the tape is reached.

The program as assembled in PAL II is given below.

```
                    *200
0200  7604  START,  CLA OSR
0201  7700          SMA CLA
0202  5206          JMP RUSH
0203  1254          TAD JLSR
0204  3220          DCA BIGN
0205  5220          JMP BIGN
0206  1255  RUSH,   TAD JHSR
0207  3220          DCA BIGN
0210  5220          JMP BIGN
                    *220
0220  0000  BIGN,   0
0221  3253  STORE,  DCA CHAR
0222  1251          TAD LESS
0223  3252          DCA MINUS
0224  1256          TAD TAB
0225  3010          DCA 10
0226  1253  REPT,   TAD CHAR
0227  1410          TAD I 10
0230  7650          SNA CLA
0231  5220          JMP BIGN
0232  2252          ISZ MINUS
0233  5226          JMP REPT
0234  1253          TAD CHAR
0235  7402          HLT
0236  5220          JMP BIGN
0237  6014  HSR,    RFC
0240  6011          RSF
0241  5240          JMP .-1
0242  7200          CLA
0243  6012          RRB
0244  5221          JMP STORE
0245  6031  LSR,    KSF
0246  5245          JMP .-1
0247  6036          KRB
0250  5221          JMP STORE
0251  7674  LESS,   0-104
0252  0000  MINUS,  0
0253  0000  CHAR,   0
0254  5245  JLSR,   JMP LSR
0255  5237  JHSR,   JMP HSR
0256  0256  TAB,    TABLE-1
0257  7600  TABLE,  0-200
0260  7574  0-204
0261  7566  0-212
0262  7563  0-215
0263  7540  0-240
```

0264	7537	0-241
0265	7536	0-242
0266	7535	0-243
0267	7534	0-244
0270	7533	0-245
0271	7532	0-246
0272	7531	0-247
0273	7530	0-250
0274	7527	0-251
0275	7526	0-252
0276	7525	0-253
0277	7524	0-254
0300	7523	0-255
0301	7522	0-256
0302	7521	0-257
0303	7520	0-260
0304	7517	0-261
0305	7516	0-262
0306	7515	0-263
0307	7514	0-264
0310	7513	0-265
0311	7512	0-266
0312	7511	0-267
0313	7510	0-270
0314	7507	0-271
0315	7506	0-272
0316	7505	0-273
0317	7504	0-274
0320	7503	0-275
0321	7502	0-276
0322	7501	0-277
0323	7500	0-300
0324	7477	0-301
0325	7476	0-302
0326	7475	0-303
0327	7474	0-304
0330	7473	0-305
0331	7472	0-306
0332	7471	0-307
0333	7470	0-310
0334	7467	0-311
0335	7466	0-312
0336	7465	0-313
0337	7464	0-314
0340	7463	0-315
0341	7462	0-316
0342	7461	0-317
0343	7460	0-320
0344	7457	0-321
0345	7456	0-322
0346	7455	0-323
0347	7454	0-324
0350	7453	0-325
0351	7452	0-326
0352	7451	0-327

```
0353   7450   0-330
0354   7447   0-331
0355   7446   0-332
0356   7445   0-333
0357   7444   0-334
0360   7443   0-335
0361   7442   0-336
0362   7441   0-337
0363   7401   0-377

BIGN     0220
CHAR     0253
HSR      0237
JHSR     0255
JLSR     0254
LESS     0251
LSR      0245
MINUS    0252
REPT     0226
RUSH     0206
START    0200
STORE    0221
TAB      0256
TABLE    0257
```

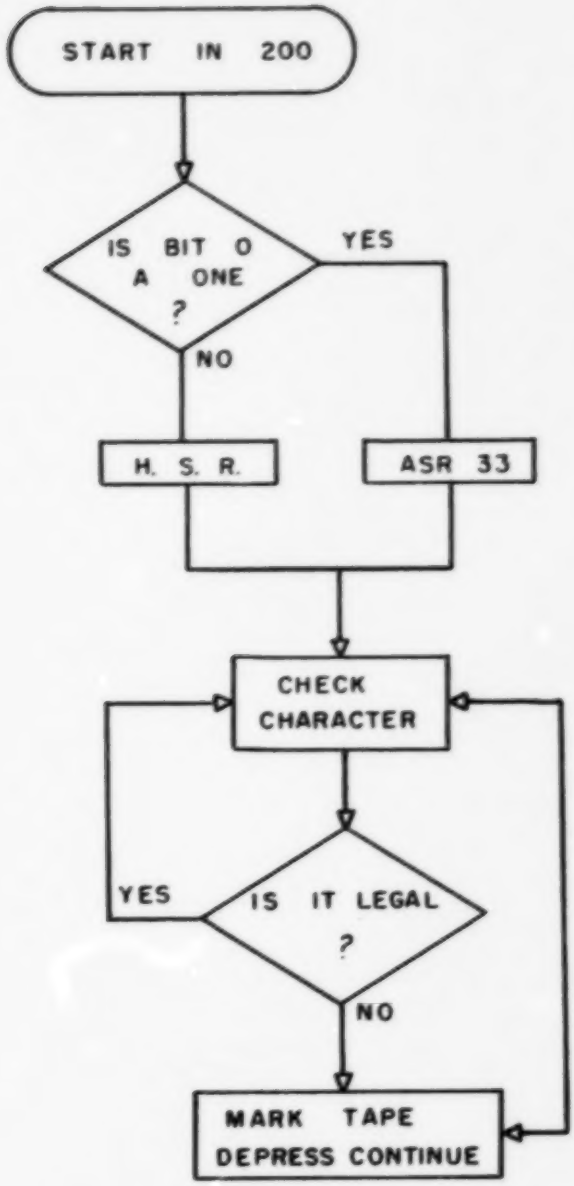

Figure 1 - Flow diagram of illegal character detector tape.